M. J. Bradley & Associates
1000 Elm Street
Second Floor
Manchester, NH 03101

Tel: 603-647-5746
Fax: 603-647-0929
www.mjbradley.com

April 21, 2010

Mr. Joseph Su
Massachusetts DEP
Northeast Regional Office
205B Lowell Street
Wilmington, MA 01887

RE: Chelsea-Sandwich, LLC, Chelsea Terminal, RTO Compliance Test Report
Conditional Approval No. MBR-08-IND-007

Dear Mr. Su:

Attached, please find the hard copy of the report for the above-reference compliance test that was conducted on February 4, 2010 with follow up additional sampling for sulfur analysis on March 3, 2010. Per your request, also enclosed is a compact disc containing the report. A summary of key results of the test program are presented below followed by a summary of process conditions during testing and a discussion about certain Conditional Approval requirements that need to be modified in light of the compliance test results.

Summary of Key Results

- **VOC Destruction Removal Efficiency (DRE) Across the Regenerative Thermal Oxidizer (RTO)** – Test results indicate that the RTO achieved a DRE of 99.4%, which demonstrates compliance with the required DRE of 99.0%.
- **Residual Oil Truck Loading Rack Capture Efficiency**. Test results indicate that the exhaust flow rate at each of the residual truck loading lanes was above the design target of 300 cfm. Based on the measured exhaust rate being above 300 cfm and supplemental assessment of VOC concentration in the area above the truck hatch, the system was deemed to meet the required 90% capture efficiency.
- **Residual Oil Storage Tank Hood Capture Efficiency**. Test results indicate that the exhaust flow rate at each of the storage tank capture hoods was slightly below the design target of 560 cfm, however, the supplemental assessment comparing the VOC concentration inside the hood verses the air intake showed that capture was well above than the required capture efficiency of 95%. Because the flows from the loading rack capture points was well above the design parameter of 300 cfm and the flows from the storage tank capture points were slightly below the design parameter of 560 cfm, Chelsea-Sandwich will have the flexibility to adjust the damper settings in order to draw additional flow from the storage tanks.

- **Total Reduced Sulfur (TRS) DRE across the RTO**. Results of the testing conducted on February 4, 2010 indicate that all of the samples (inlet and outlet), with the exceptions as discussed below, were below the detection limit of the approved method. The exception included a note from the laboratory in which the carbonyl sulfide "hit" in the Inlet Run 2, Outlet Run 1, and Outlet Run 2 samples were suspected artifacts from the type of Tedlar bag that was used in the sampling program.

  Because the inlet loading was expected to be measurable based on earlier pretesting, a sampling error was suspected and a second set of samples were taken on March 3, 2010. This set of samples used the "Zefon" style Tedlar bag to eliminate the artifact problem. However, the second set of samples also indicated that the inlet sulfur concentration was non detectable. It should also be noted that the Inlet Run 1 sample was taken by directly filling the bag using a Teflon lined diaphragm pump. This procedure did not follow the evacuated lung protocol and was only used for informational purposes.

  Because the sulfur concentration results were so low at the inlet, a DRE is not demonstrable. M.J. Bradley proposes that the result of non detect via the approved method be deemed as the RTO exhaust being in fulfillment of the obligation to maintain low sulfur emission as opposed to 99% DRE requirement.

Summary of Process Conditions

Appendix C of the compliance test report contains the pertinent process data that documents the activities that occurred during the testing. The three 1-hour VOC tests on February 4, 2010 were from 6:45 to 7:45 am, 8:05 to 9:05 am and 9:25 to 10.25 am.

Residual Oil

Based on the bill of lading (BOL) Records report, over test period a total of 47,005 gallons (gross volume) of residual oil was loaded into trucks representing seven loading events. A Tank Report documenting the status of the storage tanks at the beginning of 2/4/2010 (actually listed at midnight 2/3/2010) shows that the six controlled storage tanks contained over 8 million gallons of residual oil with an average temperature of 134 °F.

RTO

A printout of the RTO combustion chamber temperature over the time period of the compliance test shows a steady trend oscillating from 1600 to 1650 °F. Additionally, a process data sheet is included that shows the daily data recorded for the RTO, the pre-filter (mist eliminator) and the two main inlet ducts (one from the loading rack and one from the storage tanks). The data is collected each morning and the entry for 2/4/2010 is included on a 14-day sheet that has entries from 1/31/2010 through 2/11/2010.

Discussion of Conditional Approval Provisions

Oil Analysis

Conditional Approval No. MBR-08-IND-007 contains a testing requirement within Table 3 to perform a residual fuel oil sample analysis annually to compare to the results of analysis for samples taken during compliance testing. The premise was that VOC emission calculations could be adjusted based on the results. However, as pointed out in the approved compliance test protocol, residual oil is comprised of virtually 100 percent volatile organic compounds and testing is not needed to establish that fact. The composition of residual oil may vary from shipment to shipment regarding to the exact proportions of individual organic compounds. However, there is not an established correlation between evaporative emissions and the infinite variations that could occur with complex chemical analysis. Therefore, in lieu of the residual oil analysis approach, the approved test protocol proposed that the inlet VOC results would be used in to document that the concentration of VOC is at or below the level used to calculate potential emissions (2,000 ppm as propane). The average during the 2/4/2010 compliance test was 852 ppm as propane. Chelsea-Sandwich LLC proposes that an annual test of the RTO inlet will be conducted using a handheld VOC analyzer to confirm that the level is less than 2,000 ppm as propane in place of the current requirement to analyze residual oil samples semi annually.

Capture Demonstration

Conditional Approval No. MBR-08-IND-007 contains a testing requirement within Table 3 to monitor the face velocity of the residual oil storage tank capture system and the residual oil truck loading capture system to compare with face velocities measured during the compliance testing. As pointed out in the approved compliance test protocol, Chelsea Terminal proposed to take flow measurements at each capture point along with staic pressure readings in the two main ducts (one for the loading rack and one for the storage tanks). Below are the results and proposed alternative to the monthly face velocity measurement requirement.

Truck Loading – As listed in Section A.4 of the Compliance Test Report, the 10 residual oil loading lanes averaged 350 cfm while the static pressure gauge ranged from -11 to -15 inches of water column. This is consistent with the vendor recommended static pressure setting to assure sufficient flow/face velocity at each lane of the loading rack to meet 90 percent capture. Chelsea-Sandwich LLC proposes that an annual test be conducted to verify the flow for each residual oil loading lane and a daily documentation of the duct static pressure to assure that the capture system is functioning properly. This procedure, along with the daily inspection and maintenance of the loading rack emission capture hoses, will be part of the SOMP.

Tank Vents – As listed in Section A.4 of the Compliance Test Report, the six residual oil storage tanks averaged 513 cfm while the static pressure gauge reading ranged from -14 to -15 inches of water column. This is consistent with the recommended static pressure setting to assure sufficient flow/face velocity at each residual oil storage tank to meet 95 percent capture. Chelsea-Sandwich LLC proposes that an annual test be conducted to verify the flow of each residual oil tank capture hood and a daily documentation of the duct static pressure to assure that the capture system is functioning properly. This procedure will be part of the SOMP.

If you have any questions, please do not hesitate to call me, at (603) 647-5746.

Sincerely,

Stephen Piper, P.E.
Senior Project Manager

Attachments:
Final Compliance Test Report

CC: Ron Kenny, Chelsea-Sandwich LLC – Regional Operations Manager
Jim Lally, Chelsea-Sandwich LLC – Chelsea Terminal Manager
Tom Keefe, Chelsea-Sandwich LLC – EHS Manager